Having thus defined the invention, the following is claimed:

1. An electric arc welding system for creating a first AC welding arc with a first current waveform between a first electrode and a workpiece by a first power supply and a second AC welding arc with a second current waveform between a second electrode and a workpiece by a second power supply as said first and second electrodes are moved in unison along a welding path, said first and second power supply each comprising an high speed switching inverter creating its waveform by a number of current pulses occurring at a frequency of at least 18 kHz with the magnitude of each current pulse controlled by a wave shaper and the polarity of said waveforms controlled by a signal, wherein said first and second AC waveforms have a positive portion and a negative portion and a cycle period of about 10-20 ms, a first timing circuit for determining the push time of a sustained maintenance of opposite polarity between said waveforms and a waveform adjusting circuit to limit said push time to less than about 5.0 ms.

2. An electric arc welding system as defined in claim 1 wherein said AC waveforms are generally sinusoidal.

3. An electric arc welding system as defined in claim 2 including a second timing circuit for determining the pull time of a sustained maintenance of the same polarity between said waveforms and a second waveform adjusting circuit to limit said pull time to less than about 5.0 ms.

4. An electric arc welding system as defined in claim 1 including a second timing circuit for determining the pull time of a sustained maintenance of the same polarity between said waveforms and a second waveform adjusting circuit to limit said pull time to less than about 5.0 ms.

5. An electric arc welding system as defined in claim 4 wherein one of said waveforms is generally a square AC waveform.

6. An electric arc welding system as defined in claim 1 wherein one of said waveforms is generally a square AC waveform.

7. An electric arc welding system as defined in claim 4 wherein both of said waveforms are generally a square AC waveform.

8. An electric arc welding system as defined in claim 1 wherein both of said waveforms are generally a square AC waveform.

9. An electric arc welding system as defined in claim 4 wherein one of said waveforms is a pulse AC waveform.

10. An electric arc welding system as defined in claim 1 wherein one of said waveforms is a pulse AC waveform.

11. An electric arc welding system for creating a first AC welding arc with a first current waveform between a first electrode and a workpiece by a first power supply and a second AC welding arc with a second current waveform between a second electrode and a workpiece by a second power supply as said first and second electrodes are moved in unison along a welding path, said first and second power supply each comprising an high speed switching inverter creating its waveform by a number of current pulses occurring at a frequency of at least 18 kHz with the magnitude of each current pulse controlled by a wave shaper and the polarity of said waveforms controlled by a signal, wherein said first and second AC waveforms have a positive portion and a negative portion and a cycle period of about 10-20 ms, a timing circuit for determining the pull time of a sustained maintenance of same polarity between said waveforms and a waveform adjusting circuit to limit said pull time to less than about 5.0 ms.

12. An electric arc welding system as defined in claim 11 wherein said AC waveforms are generally sinusoidal.

13. An electric arc welding system as defined in claim 12 wherein one of said waveforms is generally a square AC waveform.

14. An electric arc welding system as defined in claim 11 wherein one of said waveforms is generally a square AC waveform.

15. An electric arc welding system as defined in claim 12 wherein both of said waveforms are generally a square AC waveform.

16. An electric arc welding system as defined in claim 11 wherein both of said waveforms are generally a square AC waveform.

17. An electric arc welding system as defined in claim 12 wherein one of said waveforms is a pulse AC waveform.

18. An electric arc welding system as defined in claim 11 wherein one of said waveforms is a pulse AC waveform.

19. An electric arc welding method for creating a first AC welding arc with a first current waveform between a first electrode and a workpiece by a first power supply and a second AC welding arc with a second current waveform between a second electrode and a workpiece by a second power supply as said first and second electrodes are moved in unison along a welding path, said first and second power supply each comprising an high speed switching inverter creating its waveform by a number of current pulses occurring at a frequency of at least 18 kHz with the magnitude of each current pulse controlled by a wave shaper and the polarity of said waveforms controlled by a signal, wherein said first and second AC waveform have a positive portion and a negative portion and a cycle period of about 10-20 ms, said method comprising:

(a) determining the push time of a sustained maintenance of opposite polarity between said waveforms; and,

(b) adjusting said waveforms to limit said push time to less than about 5.0 ms.

20. An electric arc welding method as defined in claim 19 wherein said AC waveforms are generally sinusoidal.

21. An electric arc welding method as defined in claim 20 further including:

(c) determining the pull time of a sustained maintenance of the same polarity between said waveforms; and,

(d) adjusting said waveforms to limit said pull time to less than about 5.0 ms.

22. An electric arc welding method as defined in claim 19 including a second timing circuit for determining the pull time of a sustained maintenance of the same polarity between said waveforms and a second waveform adjusting circuit to limit said pull time to less than about 5.0 ms.

23. An electric arc welding method as defined in claim 22 wherein one of said waveforms is generally a square AC waveform.

24. An electric arc welding method as defined in claim 19 wherein one of said waveforms is generally a square AC waveform.

25. An electric arc welding method as defined in claim 22 wherein both of said waveforms are generally a square AC waveform.

26. An electric arc welding method as defined in claim 19 wherein both of said waveforms are generally a square AC waveform.

27. An electric arc welding method as defined in claim 22 wherein one of said waveforms is a pulse AC waveform.

28. An electric arc welding method as defined in claim 19 wherein one of said waveforms is a pulse AC waveform.

29. An electric arc welding method for creating a first AC welding arc with a first current waveform between a first electrode and a workpiece by a first power supply and a second AC welding arc with a second current waveform between a second electrode and a workpiece by a second power supply as said first and second electrodes are moved in unison along a welding path, said first and second power supply each comprising an high speed switching inverter creating its waveform by a number of current pulses occurring at a frequency of at least 18 kHz with the magnitude of each current pulse controlled by a wave shaper and the polarity of said waveforms controlled by a signal, wherein said first and second AC waveforms have a positive portion and a negative portion and a cycle period of about 10-20 ms, said method comprising:

(a) determining the pull time of a sustained maintenance of same polarity between said waveforms; and,

(b) adjusting said waveforms to limit said pull time to less than about 5.0 ms.

30. An electric arc welding method as defined in claim 29 wherein said AC waveforms are generally sinusoidal.

31. An electric arc welding method as defined in claim 30 wherein one of said waveforms is generally a square AC waveform.

32. An electric arc welding method as defined in claim 29 wherein one of said waveforms is generally a square AC waveform.

33. An electric arc welding method as defined in claim 30 wherein both of said waveforms are generally a square AC waveform.

34. An electric arc welding method as defined in claim 29 wherein both of said waveforms are generally a square AC waveform.

35. An electric arc welding method as defined in claim 30 wherein one of said waveforms is a pulse AC waveform.

36. An electric arc welding system as defined in claim 19 wherein one of said waveforms is a pulse AC waveform.

37. An electric arc welding method as defined in claim 29 wherein the welding process is submerged arc.

38. An electric arc welding method as defined in claim 19 wherein the welding process is submerged arc.

39. An electric arc welding system as defined in claim 11 wherein said system is a submerged arc system.

40. An electric arc welding system as defined in claim 1 wherein said system is a submerged arc system.